

reference" *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). **Nowhere** does Noji disclose each and every element of the claimed invention. Noji does not teach "A vapor lubrication station, comprising: one or more cold traps to prevent migration of lubrication molecules that are not deposited onto storage discs during a vapor lubrication process from the vapor lubrication station into adjacent process chambers." Noji teaches using a cold trap for "evacuating a vacuum chamber" and not using a cold trap to prevent migration of lubrication molecules. Moreover, Noji does not suggest mention or allude to a vapor lubrication station as suggested by the Examiner in his comment "vapor lubrication station (10 in figure 2)." In fact, Noji's vapor lubrication station (10 in figure 2) is really a hermetic chamber and not a lubrication chamber. Noji's only reference to lubrication is the lubrication used in old vacuum pumps. Not only is vacuum pump lubrication the only instance where lubrication is mentioned, Noji freely admits that it is preferable to use dry pumps which do not introduce lubricants into the vacuum chamber instead of conventional pumps having lubricants. It is clear that Noji is trying to keep lubricants out of his vacuum system and not put lubricants into it as the current invention claims. In column 2 lines 38-43 of the '226 patent Noji states:

The hermetic chamber may be a semiconductor processing chamber, and as necessary, a gas scrubber can be provided for detoxifying or safening the spent gas. It is preferable that the vacuum pump be a dry type in which lubricant is not used in the evacuation passage to avoid contamination by diffusion of lubricant oil vapors.

Since Noji does not mention a lubrication station, Noji cannot anticipate the claimed invention and the Applicant's respectfully request that the Examiner reconsider his rejection of the claimed invention.

The Examiner also states that "Noji further teaches wherein the vapor lubrication station is held under low working pressure in the range of about 5×10^{-5} to 5×10^{-9} Torr by means of high performance vacuum pumps (12)." The Applicants respectfully traverse. Noji does not mention any pressure that is even within the approximate range of 5×10^{-5} to 5×10^{-9} Torr.

The Examiner also states "Noji further teaches wherein the cold traps comprise cold trapping surfaces (60) to prevent migration of lubricant molecules that are not deposited onto the disk into the adjacent process chambers." The Applicants respectfully traverse. Noji does not mention, suggest or allude to the existence of any lubricant molecules that are deliberately deposited onto a disk.

The Examiner also states "Noji further teaches wherein the cold trapping surfaces are cooled to have a temperature in the range of about -195 degrees C to -25 degrees C using refrigerants selected from a group consisting of liquid nitrogen, low temperature refrigerant, and cold water (column 4, lines 58-62)." The Applicants respectfully traverse. Noji does not teach cooling at temperatures anywhere near the temperature range of -195 degrees C to -25 degrees C claimed by the Applicants. Although Noji does teach in column 4 lines 58-62 that "liquid nitrogen, chilled air, or chilled water is supplied," the Examiner is making a huge assumption in assuming that these coolants will result in a cooling temperature range of about -195 degrees C to -25 degrees C. Therefore, since Noji does disclose the claimed temperature range Noji does not anticipate the claimed invention.

The Examiner also states "Noji further teaches one or more temperature sensors (58) to sense the temperature of the cold trapping surfaces and to output a signal

proportional to the sensed temperature, and controlled circuitry coupled to the temperature sensors to monitor the temperature of the cold trapping surfaces by receiving the signal from the temperature sensors (column 6, lines 28-39).” The Applicants respectively traverse. Even if the Examiner is correct and Noji teaches everything stated by the Examiner, Noji still does not teach all the elements of claim 15. Claim 15 recites “...a control circuitry coupled to the temperature sensors to monitor the temperature of the cold trapping surfaces by receiving the signal from the temperature sensors, and further to automatically shut-off the operation of the vapor lubrication station to prevent accidental migration of lubrication molecules due to a failure in the operation in the cold traps.” Since the Examiner has not shown that Noji’s temperature sensor is used to automatically shut off the vapor lubrication station in the event of a failure, Noji does not anticipate claims 6, 8, 10, and 12-15. Additionally, the previously presented arguments that Noji does not teach a lubrication station are applicable here. In view of these arguments the Applicants respectfully request that the Examiner reconsider his rejection of claims 6, 8, 10, and 12-15.

The Examiner also rejected claim 20 under 35 U.S.C. 102(e) as being clearly anticipated by Noji et al (6,158,226). “Under 35 U.S.C. § 102, anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference” *Akzo N.V. v. U.S. Int’l Trade Comm’n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). Again, Noji does not disclose a lubrication station and or even suggest the existence of a lubrication station. Therefore, Noji cannot anticipate claim 20 and the Applicants respectfully request that the Examiner reconsider his rejection of claim 20.

In view of these remarks and arguments the Applicants respectfully request that the Examiner reconsider his rejection of the claims under 35 U.S.C. 102(e) as being clearly anticipated by Noji et al (6,158,226).

Rejection Under Lee et al (6,241,793)

The Examiner rejected claims 6, 8, 10, and 12-14 under 35 U.S.C. 102(e) as being clearly anticipated by Lee et al (6,241,793). The Examiner stated that "Lee et al teaches a vapor lubrication station comprising one or more cold traps (40) to prevent migration of lubrication molecules that are not deposited onto storage discs during a vapor lubrication process from the vapor lubrication station (12 in figure 1) into adjacent process chambers (18)." The Examiner's interpretation of chamber 12 as a lubrication station is erroneous because Lee clearly states in column 1 lines 54-65 that:

As shown in FIG. 1, a vertical furnace unit 12 is the heart of a silicon nitride deposition system 10. During the deposition of a silicon nitride film on a plurality of wafers positioned in the vertical furnace, the furnace exhaust gas 14 which contains unreacted reactant gases such as dichlorsilane, ammonium and reaction byproduct ammonium chloride powder is sent through a cold trap 20 before it enters into a gas treatment unit 18 and be released into a factory exhaust system 22. The capture of substantially all the ammonium chloride fine powder in a cold trap 20 is therefore an important step in a successful exhaust gas treatment process for depositing silicon nitride.

Chamber 12 is clearly a furnace unit and not a lubrication station. In fact, nowhere in the Lee patent is a lubricant or anything that resembles a lubricant mentioned. The Examiner does not appear to distinguish between the two although the law is perfectly clear that for an anticipation rejection each and every element of the claimed invention be disclosed in a prior art reference. In light of these arguments the applicants respectfully request that the Examiner reconsider his rejection of claims 6, 8, 10, and 12-14.

The Examiner also states that "Lee et al further teaches wherein the vapor lubrication station is held under low working pressure in the range of about 5×10^{-5} to 5×10^{-9} Torr by means of high performance vacuum pumps (35)." The Applicants respectfully traverse. Lee et al does not mention any pressure that is even within the approximate range of 5×10^{-5} to 5×10^{-9} Torr. In fact the only pressure that Lee et al mentions is in column 1 lines 33-35 where he states "The hot-wall LPCVD system is normally carried out at a temperature between about 750.degree..about.800.degree. C. and the chamber pressure is kept at several hundred m Torr." Since several hundred m Torr pressure is in the range of 10^{-1} torr, Lee et al does not teach any pressures within the range 5×10^{-5} to 5×10^{-9} Torr.

The Examiner also states "Lee et al further teaches wherein the cold traps comprise cold trapping surfaces (60) to prevent migration of lubricant molecules that are not deposited onto the disk into the adjacent process chambers." The Applicants respectfully traverse. Lee et al does not mention, suggest or allude of any lubricant molecules.

The Examiner also states "Lee et al further teaches wherein the cold trapping surfaces are cooled to have a temperature in the range of about -195 degrees C to -25 degrees C using refrigerants selected from a group consisting of liquid nitrogen, low temperature refrigerant, and cold water (column 5, lines 8-11)." The Applicants respectfully traverse. Lee et al does not teach cooling at temperatures anywhere near the temperature range of -195 degrees C to -25 degrees C claimed by the Applicants. In fact Lee et al teaches in column 5 lines 8-11 that "A suitable heat-transfer fluid used for pumping through the cooling plate 50 may be chilled DI water or city water at a

temperature between about 10.degree. C. and about 18.degree. C., and preferably at about 15.degree. C.” Clearly Lee et al’s temperature range is significantly different than that of the Applicants’ claimed temperature range and therefore Lee et al does not anticipate the claimed invention.

The Examiner also rejected claim 20 under 35 U.S.C. 102(e) as being clearly anticipated by Lee et al (6,241,793) because “Lee et al teaches a vapor lubrication station comprising means (12) to deposit lubrication molecules onto storage discs, and mean (40) to prevent migration of molecules that are not deposited onto storage discs during a vapor lubrication process in the vapor lubrication station (12) into adjacent process chambers (18).” The Applicants respectfully traverse. “Under 35 U.S.C. § 102, anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference” *Akzo N.V. v. U.S. Int’l Trade Comm’n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). Again, Lee et al does not disclose or even suggest the existence of a lubrication station, storage discs, or lubrication molecules. Therefore, Lee et al cannot anticipate claim 20 and the Applicant’s respectfully request that the Examiner reconsider his rejection of claim 20.

In view of these remarks and arguments the Applicants respectfully request that the Examiner reconsider his rejection of the claims under 35 U.S.C. 102(e) as being clearly anticipated by Lee et al (6,241,793).

Rejection Under Nguyen (US 2002/0096113)

The Examiner rejected claims 6-9 and 12-15 under 35 U.S.C. 102(e) as being clearly anticipated by Nguyen (US 2002/0096113). Since the Applicants patent

application was filed on April 12, 2001 but claims the benefit of U.S. Provisional Application Serial Number 60/197,230 filed April 14, 2000 and the Nguyen reference was filed on January 19, 2001, the Nguyen patent application is not prior art under 35 U.S.C. 102 (e). Therefore, the Applicants respectfully request that the Examiner reconsider his rejection of claims 6-9 and 12-15 under 35 U.S.C. 102(e) as being clearly anticipated by Nguyen (US 2002/0096113).

Even if the Nguyen patent application were valid prior art, the Nguyen patent application still does not anticipate the claimed invention because it does not disclose each and every element of the claimed invention. The Examiner stated that "Nguyen teaches a vapor lubrication station comprising one or more cold traps (36) to prevent migration of lubrication molecules that are not deposited onto storage discs during a vapor lubrication process from the vapor lubrication station (1 in figure 4) into adjacent process chambers (see figure 4)." The Examiner's interpretation of process chamber 1 in fig. 4 as a lubrication station is speculative, at best, because Nguyen never mentions, suggest or alludes to a vapor lubrication station. In fact, Nguyen does not even mention the word lubrication in the entire specification and it is clear that the Applicants' claimed invention is directed to a cold trap for "preventing migration of lubrication molecules that are not deposited onto storage discs during a vapor lubrication process from the vapor lubrication station into adjacent process chambers."

The Examiner also states that "Nguyen further teaches wherein the vapor lubrication station is held under low working pressure in the range of about 5×10^{-5} to 5×10^{-9} Torr by means of high performance vacuum pumps (35)." The Applicants respectfully traverse. Nguyen does not mention any pressure that is even within the

general range of 5×10^{-5} to 5×10^{-9} Torr. In fact the only pressure that Nguyen mentions is in paragraph [0007] where he states "Both CVD and etching processes often occur at reduced atmospheric pressure (typically Torr pressure for CVD processes and milliTorr pressure for etching processes) to prevent contamination and impurity incorporation. Typical process reactor then includes a process pump to maintain this reduced atmospheric pressure." Since millitorr pressure is in the range of 10^{-3} torr, Nguyen does not teach any pressures within the range 5×10^{-5} to 5×10^{-9} Torr.

The Examiner also states "Nguyen further teaches wherein the cold traps comprise cold trapping surfaces to prevent migration of lubricant molecules that are not deposited onto the disk into the adjacent process chambers." The Applicants respectfully traverse. Nguyen does not mention, suggest or allude to the existence of any lubricant molecules.

The Examiner also states "Nguyen further teaches wherein the cold trapping surfaces are cooled to have a temperature in the range of about -195 degrees C to -25 degrees C using refrigerants selected from a group consisting of liquid nitrogen, low temperature refrigerant, and cold water (paragraph 15, lines 10-13)." The Applicants respectfully traverse. Nguyen does not mention the kind of refrigerant used and the Examiner is merely assuming that Nguyen is using refrigerants selected from a group consisting of liquid nitrogen, low temperature refrigerant, and cold water.

The Examiner also rejected claim 20 under 35 U.S.C. 102(e) as being clearly anticipated by Nguyen (US 2002/0096113) because "Nguyen teaches a vapor lubrication station comprising means (1) to deposit lubrication molecules onto storage discs, and mean (36) to prevent migration of molecules that are not deposited onto storage discs

during a vapor lubrication process in the vapor lubrication station (1) into adjacent process chambers (see figure 4).” The Applicants respectfully traverse. “Under 35 U.S.C. § 102, anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference” *Akzo N.V. v. U.S. Int’l Trade Comm’n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). Again, Nguyen does not disclose or even suggest the existence of a lubrication station, storage discs, or lubrication molecules. Therefore, Nguyen cannot anticipate claim 20 and the Applicant’s respectfully request that the Examiner reconsider his rejection of claim 20.

In view of these remarks and arguments the Applicants respectfully request that the Examiner reconsider his rejection of the claims under 35 U.S.C. 102(e) as being clearly anticipated by Nguyen (US 2002/0096113).

Rejection Under Caton et al (5,303,558)

The Examiner rejected claims 6, 8 and 10-14 under 35 U.S.C. 102(b) as being clearly anticipated by Caton et al (5,303,558) because “Caton et al teaches a vapor lubrication station comprising one or more cold traps (14) to prevent migration of lubrication molecules that are not deposited onto storage discs during a vapor lubrication process from the vapor lubrication station (12 in figure 1) into adjacent process chambers (not shown).” The Applicants respectfully traverse because under 35 U.S.C. § 102, anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference. Since Caton et al does not disclose adjacent process chambers, as conceded to by the Examiner in his statement and as is obvious by looking at figure 1, it

is impossible that Caton anticipates the claimed invention that calls for an adjacent process chamber.

The Examiner also states "Caton et al further teaches one or more entry/exist ports disposed between the vapor lubrication station and/or the adjacent process chambers, wherein the one or more cold traps are disposed around the one or more entry/exit ports, respectively. Caton et al further teaches wherein the one or more entry/exit ports comprise valves (34) that open and close." The Applicants respectfully traverse. Caton et al does not teach one or more entry/exit ports and valves 34 are not entry/exit ports. Clearly valve 34 is an isolation valve as Caton describes in column 2 line 57-58 which isolates the cold trap from the process chamber. Valve 34 cannot possibly be confused for an entry/exit port and it is very unlikely that anyone skilled in the art would confuse it for such a thing. Additionally, and as already argued, Caton et al does not disclose an adjacent process chamber so an entry/exit port from where to bring disks into and out of has no meaning. Therefore, Caton et al does not anticipate the claimed invention.

The Examiner also states that "Caton et al further teaches wherein the vapor lubrication station is held under low working pressure in the range of about 5×10^{-5} to 5×10^{-9} Torr by means of high performance vacuum pumps (16)." The Applicants respectfully traverse. Caton et al. does not mention any pressure that is even within the general range of 5×10^{-5} to 5×10^{-9} Torr. In fact the only pressure that Caton et al. mentions is in column 3 lines 29-33 where he states "the pump 16 maintains the pressure within the process chamber at about 200 millitorr during the processing cycle by drawing exhaust gasses from the chamber 12 into the thermal trap 14 where the ammonium

chloride is trapped." Since 200 millitorr pressure is in the range of 10^{-1} torr, Caton et al. does not teach any pressures within the range 5×10^{-5} to 5×10^{-9} Torr.

The Examiner also states "Caton et al. further teaches wherein the cold traps comprise cold trapping surfaces (80) to prevent migration of lubricant molecules that are not deposited onto the disk into the adjacent process chambers." The Applicants respectfully traverse. Caton et al. does not mention, suggest or allude of any lubricant molecules.

The Examiner also states "Caton et al. further teaches wherein the cold trapping surfaces are cooled to have a temperature in the range of about -195 degrees C to -25 degrees C using refrigerants selected from a group consisting of liquid nitrogen, low temperature refrigerant, and cold water (column 5, lines 40-53)." The Applicants respectfully traverse. Caton et al does not teach cooling at temperatures anywhere near the temperature range of -195 degrees C to -25 degrees C claimed by the Applicants. In fact Caton et al. et al teaches in column 5 lines 40-53 that:

In the present embodiment, the collection surface 80 includes all exposed surfaces of the coil 84 and of the portions of the tubing leading to the coil that are within the enclosure 44. Fluid F is circulated through the coil 84 by entering inlet 52 and exiting outlet 54. In the present embodiment, the fluid F is water having a temperature of about 15.degree. C. The water can be supplied by the city water system, or it can be provided via a cooling loop. In either case, the water circulating through the coil 84 will maintain the temperature of the collection surface 80 well below the condensation temperature of 125.degree. C. of the ammonium chloride, causing any gaseous ammonium chloride to condense as a solid on the collection surface 80. It is preferred that the coolest water be provided at the bottom of the coil 84 (where collection and gas temperature is the greatest), but the direction of fluid flow can be reversed with very little diminution in efficiency.

Clearly Caton et al's temperature range is significantly different than that of the Applicants and therefore Caton et al. et al does not anticipate the claimed invention.

The Examiner also rejected claim 20 under 35 U.S.C. 102(e) as being clearly anticipated by Caton et al (5,303,558) because "Caton et al teaches a vapor lubrication station comprising means (12) to deposit lubrication molecules onto storage discs, and mean (14) to prevent migration of molecules that are not deposited onto storage discs during a vapor lubrication process in the vapor lubrication station (12) into adjacent process chambers (not shown)." The Applicants respectfully traverse. "Under 35 U.S.C. § 102, anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference" *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). Again, Caton et al does not disclose or even suggest the existence of a lubrication station, storage discs, lubrication molecules, or adjacent process chambers. Therefore, Caton et al cannot anticipate claim 20 and the Applicant's respectfully request that the Examiner reconsider his rejection of claim 20.

In view of these remarks and arguments the Applicants respectfully request that the Examiner reconsider his rejection of the claims under 35 U.S.C. 102(b) as being clearly anticipated by Caton et al (5,303,558).

Conclusion

In light of the above remarks, this application should be considered in condition for allowance and the case passed to issue. If there are any questions regarding these remarks or the application in general, a telephone call to the undersigned would be appreciated to expedite prosecution of the application.


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Respectfully submitted,

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